

PATENT COOPERATION TREATY
PCT
INTERNATIONAL SEARCH REPORT
(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 000711-0058	FOR FURTHER ACTION		see Form PCT/ISA/220 as well as, where applicable, item 5 below
International application No. PCT/CA2005/000138	International filing date (<i>day/month/year</i>) 03 February 2005 (03-02-2005)	(Earliest) Priority date (<i>day/month/year</i>) 03 February 2004 (03-02-2004)	
Applicant UNIVERSITE DE MONTREAL ET AL			

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows :

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ as selected by this authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☒ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2005/000138CLASSIFICATION OF SUBJECT MATTER
IPC 7 A23K 1/16, A23K 1/18

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A23K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)
WEST, DELPHION

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No(s).
X	US 6500423 (OLSHENITSKY and BUCHMAN) 31 December 2002 (31-12-2002) whole document	1,3-14,16-30
X	WO 99/08532 (DOYLE ET AL.) 25 February 1999 (25-02-1999) whole document	1,3-14,16-30

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

29 March 2005 (29-03-2005)

Date of mailing of the international search report

16 May 2005 (16-05-2005)

Name and mailing address of the ISA/CA
Canadian Intellectual Property Office
Place du Portage I, C114 - 1st Floor, Box PCT
50 Victoria Street
Gatineau, Quebec K1A 0C9
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Authorized officer

Elizabeth A. McKay Andrews (819) 997-2950

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2005/000138

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
US6500423	31-12-2002	AU778789 B2	23-12-2004
		AU2100402 A	11-06-2002
		AU4947000 A	28-12-2000
		BR0012104 A	12-03-2002
		BR0116178 A	14-10-2003
		CA2375599 A1	14-12-2000
		CA2430292 A1	06-06-2002
		CN1494374 A	05-05-2004
		EP1185618 A1	13-03-2002
		EP1343370 A2	17-09-2003
		IL130303D D0	01-06-2000
		IL156213D D0	23-12-2003
		JP2003501080T T	14-01-2003
		JP2004534512T T	18-11-2004
		MXPA03004851 A	04-05-2004
		NZ515830 A	28-11-2003
		NZ527587 A	28-01-2005
		PL352703 A1	08-09-2003
		US6500467 B2	31-12-2002
		US6503505 B2	07-01-2003
		US6511661 B2	28-01-2003
		US6514494 B2	04-02-2003
		US6524575 B2	25-02-2003
		US6524576 B2	25-02-2003
		US6534053 B2	18-03-2003
		US6534054 B2	18-03-2003
		US6544508 B2	08-04-2003
		US6544509 B2	08-04-2003
		US6544510 B2	08-04-2003
		US6569424 B2	27-05-2003
		US2004235662 A1	25-11-2004
		WO0075284 A1	14-12-2000
		WO0243649 A2	06-06-2002
		ZA200304747 A	03-09-2004
WO9908532	25-02-1999	AU735914 B2	19-07-2001
		AU8409598 A	08-03-1999
		BR9811179 A	25-07-2000
		CA2296763 A1	25-02-1999
		CN1126454C C	05-11-2003
		EP1005273 A1	07-06-2000
		JP2001514868T T	18-09-2001
		NZ502420 A	28-09-2001
		US5965128 A	12-10-1999

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

ROBIC
Centre CDP Capital
1001 Square Victoria
Bloc E - 8ieme Etage
MONTREAL, Quebec

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing (day/month/year) 16 May 2005 (16-05-2005)

Applicant's or agent's file reference
000711-0058

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/CA2005/000138

International filing date (day/month/year)
03 February 2005 (03-02-2005)

Priority date (day/month/year)
03 February 2004 (03-02-2004)

International Patent Classification (IPC) or both national classification and IPC
IPC 7 A23K 1/16, A23K 1/18

Applicant
UNIVERSITE DE MONTREAL ET AL

1. This opinion contains indications relating to the following items :

- | | |
|--|---|
| <input checked="" type="checkbox"/> Box No. I | Basis of the opinion |
| <input type="checkbox"/> Box No. II | Priority |
| <input type="checkbox"/> Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> Box No. V | Reasoned statement under Rule 43bis.1(a)(I) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement. |
| <input type="checkbox"/> Box No. VI | Certain documents cited |
| <input type="checkbox"/> Box No. VII | Certain defects in the international application |
| <input checked="" type="checkbox"/> Box No. VIII | Certain observations on the international application |

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/CA
Canadian Intellectual Property Office
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Authorized officer

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International application No.
PCT/CA2005/000138

... With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

[] This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

[] a sequence listing

[] table(s) related to the sequence listing

b. format of material

[] in written format

[] in computer readable form

c. time of filing/furnishing

[] contained in the international application as filed.

☐ filed together with the international application in computer readable form.

[] furnished subsequently to this Authority for the purposes of search.

3. [] In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statement that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments :

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

10/587960
IAP11 Rec'd PCT/PTO 31 JUL 2006

International application No.
PCT/CA2005/000138

Box No. V Reasoned statement under Rule 43bis.1(a)(I) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 2,4,5,8,9,11,15,21,22,25,26,28	YES
	Claims 1,3,6,7,10,12-14,16-20,23,24,27,29,30	NO
Inventive step (IS)	Claims 2,15	YES
	Claims 1,3-14,16-30	NO
Industrial applicability (IA)	Claims 1-30	YES
	Claims none	NO

2. Citations and explanations :

1 Reference is made to the following documents:

D1 US 6500423
D2 WO 99/08532

2 D1 teaches non-pathogenic probiotic microorganisms derived from *E. coli* are capable of restoring normal GI flora of man and a variety of mammals and avians. The use of *Escherichia coli* strain BU-230-98 ATTC Deposit No. 20226 (column 3, lines 49-51) is shown to decrease mortality and improve weight gain for piglets (Example 14), effectively treat lambs and goat kids for pathogenic *E. coli* infections (Example 19), to improve weight gain and treat diarrhea in poultry (Example 20), and treat symptoms of diarrhea in puppies (Example 21).

D2 teaches specific strains of probiotic *E. coli* having the property of inhibiting the growth of pathogenic *E. coli* O157:H7 in ruminants. It is well known that infection with pathogenic *E. coli* causes diarrhea with resultant poor weight gain in domestic animals.

3 Claims 1,3,6,7,10,12-14,16-20,23,24,27,29 and 30 are anticipated by D1 because the prior art teaches improving weight gain in mammals and avians by administering a strain of *E. coli* in the feed (solid or milk) or water of the animal. The *Escherichia coli* strain defined in the claims of the present application is not distinguished from that taught in D1, or those taught in D2. The effect on weight gain of the F4⁺ *Escherichia coli* strain defined in the claims is not shown to be different than the effect shown for the prior art *E. coli* strains. The prior art D1 specifically teaches improved weight gain for post-weaning piglets and post-hatching broiler chickens and turkeys.

Claims 1,3,6,7,10,12-14,16-20,23,24,27,29 and 30 do not meet the requirements of novelty and inventive step, and do not satisfy Article 33(2) and (3) PCT.

4 Claims 4,5,8,9,11,21,22,25,26 and 28 do not involve and inventive step over the teachings of D1 or D2. These claims define the effective amount of the *E. coli* strain for use, the age of the animal when treated, and treatment of a mouse with the *E. coli* strain to promote weight gain. The amount of bacteria to use and the age of the animal to be treated both fall within the scope of trial and error for optimizing treatment usually practised by a person skilled in the art. The treatment of mice to promote weight gain would be obvious to one skilled in the art having regard to D1 since the treatment was already shown to be effective for piglets, broiler chickens, turkeys, and puppies.

Claims 4,5,8,9,11,21,22,25,26 and 28 do not satisfy Article 33(3) PCT.

----- continued on supplemental sheet -----

Box No. VIII **Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made :

To meet the requirements of Rule 5.1(a)(ii) PCT, the documents US 6500423 and WO 99/08532 should be identified in the description and the relevant background art disclosed therein should be briefly discussed.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box No. V 2. Citations and explanations:

- 5 Claims 2 and 15 are novel and unobvious since none of the prior art teach the homogenizing of growth among a herd of animals by using a non-pathogenic *Escherichia coli* strain. Homogenous weight across a herd of animals is of economic benefit to the farmer at time of sale or slaughter.

Claims 2 and 15 satisfy the requirements of Article 33(2) and (3) PCT.

- 6 Claims 1-30 meet the requirements of Article 33(4) because optimizing weight gain in meat animals is of industrial applicability.